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POSTGRADUATE RESEARCH TRAINING IN BELGIUM

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Postgraduate research training in Belgium is a rather recent phenomenon. As in many West-European countries until the 1970s, most of the attention was given to the expansion of the university sector. New universities were created in the 1960s and 1970s in order to give more youngsters the opportunity to obtain a university education, a policy that was accompanied by increased financial support for the existing universities and the expansion of scholarships for needy students. This development took place in a volatile period in Belgian history. Belgium is a divided country with three important cleavages, which had an important effect on political decisions in those years: first the religious cleavage between the Roman Catholics and the anticlericals; second, the cleavage between the working classes and the propertied classes; third, the linguistic cleavage between the Dutch-speaking and the French-speaking groups. University expansion was influenced by these cleavages and the resulting political conflicts. Belgium has, in addition to state universities, a strong group of free universities, mainly Catholic. Each university wanted to take as much advantage of the university-expansion policy as possible. Since 1971 both systems, free and state, have been subsidized equally. Moreover, the conflicts between the Dutch-speaking group and the French-speaking group lay at the heart of fierce debate concerning the funding of university expansion in Flanders, the French-speaking Community, and Brussels (Verhoeven, 1982; Geiger, 1986: 76-90). Although the conflict has not disappeared, it has diminished as a cause of confrontation. Society has become more secularized, which has dulled the edges of the religious conflicts. Moreover, Belgium has evolved from a unitary to a federal state, in which the French-speaking and the Flemish Communities govern separately in a large number of political areas that used to be arenas of conflict for the two communities.

The development from a unitary state to a federal state took many years and ended (for the time being) in May 1993. Since then, Belgium has consisted of Communities and Regions.[1] Since 1988, education and training have been governed by the Communities. Consequently, the educational structures in the Flemish and in the French-language Community are not totally the same. Flanders gave a new legal basis to the universities by the Decree of 12 June 1991. The French-speaking Community still applies the former Belgian laws on the universities (Law of 7 July 1970; Law of 27 July 1971) but also established a new organisation of university education by the Decree of 5 September 1994. In the near future other changes may follow. Flanders and the French-speaking Community seem determined to go their own way.[2]

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1 There are three cultural Communities: The Dutch-speaking (Flemish) Community, The French-speaking Community and the German-speaking Community. Each Community has authority over its language community. There are three economic Regions: the Flemish Region, the Walloon Region, and the Brussels Region.

2 The German-speaking Community has no university.

In the meantime, the universities developed from mainly teaching institutions to research-oriented institutions. Research is more important now than in the 1960s. This was an international trend (Altbach, 1992) and Belgian universities were no exception. There was, of course, a favourable climate for starting postgraduate research training. Nevertheless, it took until 1991 before the Flemish parliament created the legal basis for the organisation of this training. Until then postgraduate research training was an individual matter between the professor and the researcher (learning by doing), which is still legally the case in the French-speaking universities. This has changed now in Flanders, although the differences between the practice in the Flemish and the French-speaking universities are not so great as the legal status of the doctoral programmes might suggest. At present, we can hardly speak of a common postgraduate research programme in all the universities because they are all free to design their own programmes. Moreover, the government did not provide funds for the organisation of these programmes. This is an additional challenge for the universities, which have to do more with the same resources (e.g. provide advanced academic courses). Other reasons why the realisation of this objective was not very successful were the lack of a tradition in the universities of postgraduate research training programmes and the lack of co-operation between the universities. Most universities developed their own programmes.

Postgraduate research training programmes have not yet taken the shape of real graduate schools. Doctoral training in Belgium is here described in six steps. First, we give a brief outline of the higher education structure and then the legal requirements of postgraduate research training. Third, we will describe the situation at the Flemish and French-speaking universities. Fourth, we will report criticisms of graduate students and give an overview of recent recommendations of an official organisation of universities concerning doctoral training programmes. Fifth, the financing doctoral studies is described. Finally, we will present some characteristics of graduate students in Belgium.

1. Postgraduate research training within the university educational structure

Higher education in Belgium is divided into three levels: university education, two-cycle colleges (*basisopleiding van 2 cycli - supérieur de type long*) and one-cycle colleges *(basisopleiding van 1 cyclus - supérieur de type court*). Two-cycle colleges, like the universities, provide university education. Therefore, their students can be admitted to doctoral training programmes at the universities. However, the organisation of doctoral training programmes and the granting of the doctoral degree remains the exclusive competence of universities.

In Flanders, postgraduate training is part of the university education system (Decree of 12 June 1991). University education consists of: 1) university training courses; 2) post-academic training and 3) continuing university training courses.

1) University training courses follow after secondary education and are organised in two cycles. The first cycle takes two or three years and leads to the degree of "candidate". The second cycle, which lasts two to four years leads to a diploma (licentiate, civil engineer, medical doctor) that is a qualification for either employment outside the university or a condition for a PhD or conducting research within the university. Each licentiate or engineer has to write a thesis to demonstrate that he or she is able to do research.

2) *Post-academic training* includes all in-service training and refresher courses organised by universities for which a certificate is granted.

3) Continuing university training courses include:

- supplementary training courses
- specialist training courses
- postgraduate research training (doctoral training courses)
- teacher training

Postgraduate research training in Flanders is thus a form of continuing academic training in a PhD-programme. As postgraduate research training is part of the university education system, it is only possible to obtain a PhD from a university, not from a two-cycle college. Moreover, universities can only offer postgraduate research training and award the academic degree of "doctor" in those scientific fields covered by undergraduate degrees.[3] During the debate on the decree, this was an important issue for some members of the Flemish Parliament and representatives of two-cycle colleges in the parliamentary hearings (MVG, 1990-1991: 389, 465), which wanted the right to grant doctorates, but this was rejected by Parliament.

The university structure in the French-speaking Community is almost the same (Décret du 5 septembre 1994). Doctoral training is part of the third cycle, which contains three types of education and training: 1) specialised training courses, 2) training in scientific research, and 3) study and work preparing a doctoral thesis or "agrégé de l'enseignement supérieur" (a degree similar to the German *Habilitation*, only open to students with a doctoral degree). As in Flanders, the doctor's degree is only granted by universities, but unlike Flanders the French-speaking Community kept the diploma of '*agrégé*'. It is interesting to note that, in spite of the arguments by the representatives of the Flemish professors in the parliamentary hearings for a 'short doctorate' for candidates who want to work in industry or to do research and for a 'long

doctorate' (*agrégé*) for those who want an academic career, the Flemish decree abolished it (MVG, 1990-1991: 461).

2. Postgraduate research training programmes: legal prescriptions

Before the Decree of 12 June 1991 was passed, a thesis based on independent scientific research, supervised by a director (promotor), and publicly defended was the only condition required for a PhD (= learning-by-doing model). It was, and still is, the right of each university to accept doctoral candidates. The rules of acceptance are determined by the university. Before a student is allowed to work for a PhD, he or she has to write a proposal that has to be defended before a jury of professors at a university. The defence of a thesis takes place before a jury composed of professors (sometimes larger than the admissive committee) in which, in some universities, professors of another university participate. Since the Decree of 12 June 1991 (Art. 32), each university may organise doctoral studies and require doctoral students to follow a training programme before defending the thesis. This training, given while the thesis is being prepared, is equivalent to one year of study. The student has to earn credits by taking courses, participating in seminars or conferences, attending summer-school sessions, and so on (see also Kouptsov, 1994). It was the intention of the Minister of Education that these doctoral studies would be organized by the universities together in internationally-oriented 'centres of excellence' (MVG, 1990-1991: 41). The model was the Dutch 'research school' (see Sonneveld, 1996 and, in this book, Blume, 1997). This intention was not realised: although students have the right to attend courses in other universities, most doctoral programmes are organized in each university separately.

From 1994 on, science policy makers have stressed that this training programme should be governed by law. Until now it has been the autonomous decision of each university whether to make it compulsory for postgraduate students to attend a training programme or to make the attendance at seminars, courses, conferences, and so on optional.[4]

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[3] Not all universities provide undergraduate training in all fields of study.

[4] In order to advise concerning this issue, the Vlaamse Interuniversitaire Raad (VL.I.R.) gathered information about the way in which different universities organise (structure and content) their doctoral training programme within the framework of the legal prescriptions of the Decree of 12 June 1991 (VL.I.R., 1995a). This is the Flemish Interuniversity Council, an umbrella organization that functions as a forum of debate and policy making. This Council also formulates policy-oriented recommendations to the Flemish parliament concerning university matters and acts as a lobbying organisation.

In the French speaking community[5] the development was similar, but, unlike the Flemish, the French-speaking parliament did not specify the content of 'study and work' in the preparation of a doctoral thesis. During the discussion on the bill, the issue of the doctorate was hardly touched upon (CCF, 1993-1994: 1:9; 1993-1994:2: 33-34; 1993-1994:3: 2) except in a reaction against an amendment proposing to make the '*agrégé*' a teacher training degree for higher education. Each university is free to define what a candidate has to do for a doctorate, and the universities have developed practices similar to the Flemish, as will be shown below.

What are the legal prescriptions for doctoral studies in the Flanders? The Decree of 12 June 1991 contains only general prescriptions to be followed in the organisation of doctoral training programmes. The doctoral training programme is a training programme in the context of the preparation of a thesis. This programme contains no fewer than 1500 and no more than 1800 hours of study or other related activities (equivalent to 1 year of study or 60 credits). Gaining these credits may be spread over the period necessary for writing the thesis. After the doctoral training programme is completed, a certificate is issued.

The following admission criteria are normally applied: 1) a second-cycle academic qualification; 2) a degree of graduate engineer-polytechnician/licentiate granted by the Royal Military Academy; 3) a licentiate diploma in commercial sciences or commercial engineer's diploma[6] granted by a second-cycle college, or 4) a diploma of a foreign university or other institution of higher education, the equivalence of which is determined by the individual university. Holders of a foreign diploma may need to pass an entrance examination (doctum colloquium).

It is important to note that the certificate of a doctoral training programme is not the same as the degree of "doctor". The student still has to defend a thesis in public. Afterwards, a jury decides whether the degree will be awarded or not. Completing a doctoral training programme is not yet sufficient for obtaining a doctoral degree at all universities. However, when students obtain a certificate of a doctoral training programme, they are counted twice for the purpose of financing the faculty.[7]

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[5] In the French-speaking Community, there is an organisation similar to the VL.I.R. This is the Conseil Interuniversitaire de la Communauté Française (C.IU.F.).

[6] At present, a licentiate diploma in commercial sciences and a commercial engineer's diploma are the only two certificates that immediately give access to a PhD-programme in the discipline 'Economic and applied economic science' without an entrance exam or other conditions (legal base in the 12 June 1991 Decree). But there are also other fields of study at universities where graduates from two-cycle colleges can do a PhD, e.g., applied sciences, language and literature, and medicine. However, there are no uniform regulations concerning this matter. Often it is even not stated explicitly which specific certificates from two-cycle colleges are considered for entrance and which not. Each university and even each faculty has its own entrance requirements (Van Linthoudt, 1996).

3. How do universities organize doctoral training programmes?

In Flanders the description of the objectives of doctoral training programmes is almost the same at all the universities. All stress contributing to knowledge within the scientific field and strengthening research capabilities. General education is also considered important. The universities differ from each other, however, on more practical issues (VL.I.R., 1995a; Kaiser et al., 1994).

In general, no extra conditions are set for admission to doctoral training programmes. At the L.U.C. and the U.F.S.I.A., a special doctoral commission decides on admission. At the K.U.Leuven, a student must obtain honors at least twice during the licentiate programme.

At almost all the universities, the programme is spread over the period it takes to write the thesis. Exceptions are the U.F.S.I.A. and the U.I.A.: at the former, the programme takes two years, and at the latter it usually takes four years.

At the RUCA, the U.F.S.I.A. and the U.I.A., each postgraduate student has to attend the training programme before he/she defends his/her thesis. At the K.U.Leuven, this depends on the individual faculty. The VUB stresses the moral duty of the students to do so, while the other Flemish universities do not impose this requirement.

Some universities have doctoral training programmes consisting of two parts: the K.U.Leuven, the RUG, and the VUB. The first part consists of courses and seminars selected by the student. About two thirds of these courses and seminars have to be especially organised in the context of the doctoral training programme. The second part consists of all other activities that are considered valuable, such as seminars, conferences, summer schools, publications, and supervising undergraduate students. In practice, each student may devise his/her own programme, which must be approved by a special doctoral commission.

Some universities offer a three-phase doctoral programme: the L.U.C., the RUCA, the U.F.S.I.A., and the U.I.A.. Those programmes are more rigorous and the students have less freedom of choice. The

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[7] In Belgium, the universities are subsidized on the basis of enrolment. We will discuss this issue later on.

different parts are mainly theoretical courses, methodological courses, tests over independent reading, and seminars.

Although the Decree of 5 September 1994 of the French-speaking Community does not lay down any rules about doctoral studies, the situation is much like that in Flanders. Universities are authorised to set up doctoral programmes and establish their own conditions. We give some examples.

At the U.C.Louvain, the competence of each doctoral candidate is assessed by a Faculty Commission. This Commission may require the doctoral student to attend courses and seminars during the first year. This can take the form of a complementary programme of theoretical training occupying one full academic year. This extra year is named "le DEA" (*Diplôme d'Etudes Approfondis*) ou "*la maîtrise*", and is considered a doctoral training programme. After the DEA, the student can submit a proposal, which then has to be approved by the Faculty Commission. It is important to note that the Faculty Commission designs the complementary training programme in function of the specific profile of the candidate. Thus, the training is not the same for all candidates (U.C.L., 1995).

At the university of Liège (U.Lg), there is no general doctoral training programme, but each faculty can require its students to attend some third-cycle courses. These courses can be organised outside the Faculty or even outside the university, but they have to be accepted by a Faculty Commission. For example, at the Faculty of Psychology and Educational Sciences, doctoral students have to take examinations and pass in third-cycle courses, which take at least 75 hours and at most 150 hours, before the thesis can be defended. The obligation to attend courses and the number of courses to be followed can differ from one faculty to another (U.Lg., 1995)

At the F.U.C.A.M. (1995), the students are encouraged to participate in international seminars and conferences, but there are no training programmes specifically for doctoral students, there being only a moral obligation to attend courses and seminars.

Although most Belgian universities decided to establish a postgraduate research training programme, the results differ not only between the universities but also within the universities themselves. These programmes do not take the form of graduate schools. The traditional pattern for a PhD (learning-by-doing) was not eliminated by the new proposals, and the resources to create a new training pattern in the universities were insufficient. Moreover, most doctoral students were employed as researchers or teaching assistants and were not full-time students. Leaving these positions would be considered to be a step backward. These create for most PhD-students a situation that they have to participate in the

postgraduate research training programme but still work as employees in a research unit. In the next section, we will look at some of these problems as seen by the students.

4. Problems concerning the doctoral studies

First, we will describe how doctoral students saw doctoral training before the introduction of postgraduate research training programme. By means of a survey conducted by mail in 1989 - this was several years before the new regulations concerning the doctoral studies in Flanders were issued - Prims (1991) compiled some critical remarks of young PhDs and doctoral students of the U.I.A.[8] Most of the students (75%) were satisfied with the personal guidance by the supervisor. Because of other obligations, the supervisors did not always have the time to organise formal meetings with their students. One third of the students complained about the informal character of the meetings. In spite of some remarks concerning the lack of time for methodological issues, most students enjoyed the atmosphere at the department. Most students with a teaching load were satisfied with it, but at the same time they thought they spent too much time teaching, and 10% even thought that this had delayed the completion of the thesis. About 70% were in favour of lectures and seminars for doctoral students, and about 40% proposed making these courses compulsory. As shown above, the new decree provided ways to respond to these expectations.

Using the data of recent research (Vandemeulebroecke et al., 1997) at the K.U.Leuven, we calculated that, in the period 1981-1985, about 46% of the doctoral students who started to work for a doctorate got one. Between 1986 and 1990, this was about 44%, and between 1991-1995 36%. Although the decree could already have been applied in the last period, it should be stressed that this was the case only for a few students. Therefore, these figures do not allow one to assess the effect of the new decree. Qualitative research with 12 former doctoral students, six of whom did not finish the thesis, revealed that students leave the doctoral programme for several reasons, such as no job contract, lack of interest of the supervisor, weak results of the research project, lack of co-operation in the department, competition among students, and stress. Women also complained about the conflict between family life and the work on the thesis.

Because universities experienced problems with the new regulations concerning the doctoral training programmes, the VL.I.R. recently recommended the following: 1) interested non-PhD students should

not be refused admittance to the doctoral training programme; 2) the training has to be directed towards the individual needs of each student; 3) as few exemptions from the programme should be given as possible; 4) universities should make more effort to organise doctoral training programmes at an inter-university level; and 5) the requirement of a programme containing 1500 to 1800 hours of study or other study activities is a disadvantage, as it leads, for example, to the selection of parts of the programme only to obtain the necessary credits (Hendrickx, 1995a; VL.I.R., 1995a).

The most important remark, however, is that it is not at all clear whether the training programmes should be compulsory or not. The VL.I.R. stresses that they are a useful and normal activity for doctoral students, but they should not be necessary to obtain the doctoral degree. The possibility of writing a thesis and of obtaining a doctoral degree without following a doctoral training programme should be kept open. It is stressed that the opportunity to do a doctorate should also be left open for candidates without a post at the university.

For the French-speaking universities, a group of researchers (Association Objectif Recherche, 1997: 7-15)[9] observed in 1996 that, depending on the university, between 17% and 84% of the doctoral students could rely on a doctoral committee for supervision, but that there were few meetings of the committees. Most of the students could rely on a supervisor, and about 80% could find a person in the university who could handle most of the problems. 26% of the students attended doctoral lectures, 42% doctoral seminars, 38% spent some time at another university, and 60% participated in conferences. About 80% of the doctoral students had to do other work besides the doctoral work, such as teaching, guidance of undergraduate students, and other research. Sometimes they lacked the necessary resources to do their own research. Consequently, the doctorate was not finished as planned.

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[8] This information was collected from only one university, and only about 50% of the PhDs and 40% of the doctoral students have responded.

[9] We note that this survey was responded to by 1022 persons out of 4000.

5. Financing doctoral students in Belgium

The financing of doctoral students in Belgium is part of the financial support of the government for scientific research. Although the Belgian government regularly stresses the importance of R&D, with the support of universities and organisations of researchers,[10] the amount of money spent for R&D as a percentage of the GDP in Belgium is less than in other European countries. In 1992, the Belgian government spent about 0.60% of the GDP on R&D, whereas France spent 1.27%, Germany 1.03%, the UK 0.91%, the Netherlands 0.85%, and Italy 0.80%. However, the Belgian figure is higher than the figures for Ireland (0.48%), Portugal (0.45%), Spain (0.53%) and Greece (0.26%) (Bogaerts, 1995: 4). From 1989 until 1994, the amount of public spending on R&D rose from 38,9 billion BEF to 48 billion BEF in 1994.

In spite of the increase in grants for scientific research in general, universities complain about the reduction of the volume for the universities. As a result of radical budget cuts - in Flanders, for example - the universities have to educate more students (+26,3%) with less staff (-9,35%) (1982-1994) (VL.I.R., 1995c). Although the basic funding increased by 5.86% in the period 1992-1995, this growth is less than inflation and less than the growth in other educational sectors. Recently, the research budget has been enlarged in both the Flemish and the French-speaking Community, but more in the former than the latter (Association Objectif Recherche, 1997).

The university grants amounted in 1995 to about 21.6 billion BEF in Flanders (Bogaert, 1995: 9) and 19.4 billion BEF in the French-speaking Community (MERF, 1995: 139). The growth of these grants is explained by the higher student enrolments and by the grants being indexed to the costs of living.

Besides these university grants (which also include research money), there is also research funding. This funding is given to universities directly by the ministry or via intermediary organisations namely, the F.W.O.-Vlaanderen, the F.N.R.S., the I.W.O.N.L.-IRSIA, and the I.W.T.[11] There are also research grants

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[10] See the comment of the SERV (The Socio-economic Council for Flanders) on the proposal of the Decree of 4 July 1991 arguing that Flanders needs more support for fundamental research (MVG, 1990-1990: 150), the policy paper 'Het wetenschapsbeleid in Vlaanderen-Beleidsbrief voor 1994', presented by the Flemish Minister-President to the Flemish Parliament on 13 October 1993 (Roelandt, 1993), and the Association Objectif Recherche (1997).

[11] F.W.O.Vlaanderen = Fonds voor het Wetenschappelijk Onderzoek Vlaanderen (Fund for Scientific Research Flanders)

I.W.O.N.L. = Instituut voor Wetenschappelijk Onderzoek in Nijverheid en Landbouw (Institute for the Promotion of Scientific Research in Industry and Agriculture). This institute only supports students of the applied sciences and the sciences.

from the federal or Community government, contract research for private companies, large national and international research programmes, etc.

This budget structure indicates how doctoral students in Belgium can be financed in different ways. We give here a brief outline of the most important financial categories.

A first category consists of university assistants. Each university/faculty has a fixed number of positions for assistants, depending on the number of undergraduate students. An assistant is appointed for two years, and the appointment may be renewed twice (total duration: six years).

A second way of funding is provided by grants from the Fund for Scientific Research and related funds. These scientific organisations outside the university are funding agencies for doctoral students. Every student who wants to do a doctorate can apply if he or she is less than 30 years old and if he or she has not worked longer than two years as a researcher. However, there are severe selection criteria (for example, an excellent academic record), and the number of positions is small. Though they are paid by these organisations, these students work in the universities.

Third, all licentiates or equivalent degree holders, on the condition of finding a supervisor (promotor) for their project and have had an excellent undergraduate career, are allowed to enter a doctoral programme. In this case, the student is not paid for working on his/her doctorate. Students with a job outside the university sometimes choose this track.

I.W.T. = Vlaams Instituut voor de bevordering van het wetenschappelijk-technologisch onderzoek in industrie (Flemish institute for the Promotion of Scientific-Technological research in Industry). From 1994 on, specialising grants from the I.W.O.N.L. were transmitted to the I.W.T.

Their counterparts in the French-speaking Community are:

F.N.R.S. = Fonds National de la Recherche Scientifique (National Scientific Research Fund)

Direction Générale des Technologies de la Recherche et de l'Energie (The General Administration of Research and Energy Technology).

Most PhD students are appointed at a university as an assistant or have a grant from a scientific organisation. In the beginning, the annual cost is between 1,116,000 BEF (student on a grant) and 1,775,000 BEF (for a student with an employee position). Although the cost of both categories is different, the net income for both is the same.[12] The social security insurance is also paid for the students on a grant. In comparison with other assistants, they only have to devote one fifth of their working time on teaching or other tasks, whilst the other assistants are supposed to spend half their working time on teaching or other tasks. Those who finance a project themselves are a minority. Besides these categories, a large number of researchers do contract research at a university (funded by federal or regional authorities, or by private companies), but most of them do not start a doctorate because these projects are the responsibility of professors.

We give the numbers of researchers and their financial sources separately for Flanders and the French-speaking Community. It should be stressed that these figures are not the same as the number of students participating in the doctoral programme. It only is an indicator of the researchers who are more likely to participate in the doctoral programme. The reason for this deficiency will be explained later. First, we look at Flanders.

[12] Volckaert and Danckaert (1997) note that some universities do not follow this principle and pay a much smaller salary.

Table 1: The number of doctoral students (FTE) at the Flemish universities according to financial source and the sex (horizontal %)

	1992				1994				1996			
	Male		Female		Male		Female		Male		Female	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Assistant	965.73	60.65	626.61	39.35	950.5	59.49	647.05	40.51	960.22	56.90	727.23	43.10
F.W.O.	276.00	70.41	116.00	29.59	262.20	66.09	134.50	33.91	294.00	61.40	185.80	38.60
Ass. Funds	75.50	53.74	65.00	46.26	66.20	63.84	37.50	36.16	55.30	69.73	24.00	30.27
IWT	28.00	51.85	26.00	48.15	137.00	62.27	83.00	37.73	263.70	66.22	134.50	33.78
Total	1345.23	61.75	833.61	38.25	1415.9	61.08	902.05	38.92	1573.22	59.48	1071.53	40.52

Source: own calculations based on VL.I.R: statistics.

Table 2: The amount of I.W.O.N.L. and (from 1994 on) I.W.T. grants at the Flemish universities

Academic year	N
1980-1981	269
1985-1986	302
1990-1991	318
1991-1992	317
1992-1993	365
1993-1994	396
1994-1995	435
1995-1996	457

Source: I.W.O.N.L. (1980-1990), Ministerie van de Vlaamse Gemeenschap: Departement Wetenschap, Innovatie en Media (1996: 106)

Table 3. The number of assistant positions (in FTE) at the Flemish universities in the different scientific fields.

	1992				1994				1996			
	Male		Female		Male		Female		Male		Female	
	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%	FTE	%
Humanities	426.85	60.22	281.95	39.78	422.35	59.34	289.40	40.66	407.95	55.35	329.10	44.85
Science + App. science	330.13	71.61	130.88	28.39	336.40	69.07	150.60	30.93	348.08	67.71	166.00	32.29
Bio-medical science	204.05	51.17	194.68	48.83	185.85	49.68	188.25	50.32	183.78	48.05	209.55	51.95
Other	4.70	20.70	18.00	79.30	5.90	23.88	18.80	76.12	10.41	31.56	22.58	68.44
Total	965.73	60.65	626.61	39.35	950.50	59.49	647.05	40.51	960.22	56.90	727.23	43.10

Source: own calculations based on VL.I.R. statistics.

Table 1 gives the distribution of the researchers over the four main financial sources according to sex. There are more assistants than F.W.O. and I.W.T. grant holders, and in each category there are more male than female students. Whereas the proportion of female assistants and F.W.O. grant holders is expanding, those of the other funds are decreasing. It is important to note the rather small group of F.W.O. positions. This makes the competition among students applying for a grant much keener.

I.W.T. funds (before 1994 I.W.O.N.L.), as given in Table 2 are specially established for science students (i.e. pure science, applied science, applied biological science, medicine and pharmacy). On the basis of the most recent data from the I.W.T., it is obvious that especially pure and applied science students are granted the major part of the positions. As is the case for the other grants, the K.U.Leuven and the R.U.G. receive the most. In the last fifteen years, the number of grant holders increased by 70%.

Table 3 shows the distribution of assistant positions within the different fields of study. Although the humanities have more assistant positions than the other two groups, they do not grant as many doctorates per year as the other groups. We should not forget that assistant positions are assigned to a faculty depending on the number of undergraduates, but that sciences and bio-medical sciences receive more financial resources for staff and operational expenditures than do the humanities. Especially in the field of science and applied science, the proportional difference between men and women is high. Only within biomedical science does there seem to be an equal distribution of male and female assistants. However, we should note that the percentage of male assistants within humanities and science and exact science is diminishing: from 60% to 55% in humanities and from 72% to 68% for science and applied science.

The number of postgraduate students as a percentage of the number of all undergraduate and postgraduate students in Flanders as shown in Table 4 is rather low and stable (about 3.6%). There was a very slight increase in 1995-1996.

Table 4: The number of postgraduate students (AAP, F.W.O., and I.W.T. in FTE) as a percentage of the number of postgraduate students and other students at Flemish universities

Academic year	Postgraduate students (AAP, F.W.O., I.W.T.)	Postgraduate students (AAP, F.W.O., I.W.T.) and other students	%
1991 - 1992	2177.74	61716.74	3.52
1993 - 1994	2317.95	65156.95	3.34
1995 - 1996	2634.75	69320.75	3.80

Source: own calculations based on VL.I.R.statistics.

In the French-speaking community, as in Flanders, there are more male than female assistants, FNRS, and FRIA bursaries (Table 5, 6, 7). This proportion seems to have remained stable over the last three years. The proportion of assistant positions compared to the total group of students is rather small (2.6%) in the last three years. This number would even decrease if we include the graduate students from second-cycle colleges (see appendix).

Table 5: The number of assistant positions at the French-speaking universities by sex

	Male		Female		Total	
Academic year	N	%	N	%	N	%
1993-1994	828	57.46	613	42.54	1441	100.00
1994-1995	882	57.68	647	42.32	1529	100.00
1995-1996	878	57.23	656	42.77	1534	100.00

Source: Le Conseil des Recteurs (1995) statistics

Table 6: The number of FNRS grant holders at the French-speaking universities by sex

Academic year	Male		Female		Total
	N	%	N	%	
1990-1991	151	64.81	82	35.19	233
1991-1992	146	65.18	78	34.82	224
1992-1993	133	65.19	71	34.81	204
1993-1994	119	59.50	81	40.50	200
1994-1995	127	60.76	82	39.24	209
1995-1996	128	58.71	90	41.29	218

Source: FNRS (1997) statistics

Table 7: The number of FRIA grant holders at the French-speaking universities by sex

Academic year	Male		Female		Total
	N	%	N	%	
1994-1995	181	59.34	124	40.66	305
1995-1996	205	62.88	121	37.12	326

Source: FNRS (1997) statistics.

Table 8: The number of postgraduate students (assistants, FNRS) as a percentage of the number of postgraduate and other students at French-speaking universities

Academic year	Students and assistant positions	Postgraduate positions	%
1993-1994	64,107	1,641	2.56
1994-1995	64,038	1,738	2.71
1995-1996	64,590	2,057	3.18

Source: own calculations based on Cref and FNRS statistics.

6. Basic figures about postgraduate research students in Belgium

In this last part of the paper, we will briefly comment on some important data concerning doctoral students in Belgium.

In the appendix we give an overview of the statistics about graduate students (university education and higher non-university education), which may serve as useful background information. These statistics cover enrolment figures and the number of degrees awarded in higher education in the Flemish Community as well as the French-speaking Community. Although these figures give an interesting picture of the situation, we have to warn that the data from of the 1980s are not always reliable and comparable with those of the 1990s.

The figures about postgraduate students which are presented above and in the following part are only an estimate of the students attending doctoral programmes. An important reason for this lack of reliable information is that each university has the freedom to organise the doctoral programme as it wishes. Even when the programme is organised on the faculty level, as is generally the case, it is not sure that all students actually enrol. They often wait to enrol until the year of the defence of the doctoral thesis because they do not want to pay the fees for every year of the doctoral training. Nevertheless, it is possible to give an approximate picture of the number of students in the programme. We will also give the number of PhDs awarded at universities.

6.1. The situation in Flanders

Table 9 shows the number of doctoral degrees awarded in the different fields of study. The numbers are not split up according to university. However, it is important to note that the two largest universities of the Flemish Community, the K.U.Leuven and the R.U.G., issue most of the doctoral degrees (about 60%).

For many fields of study, to work for a doctorate is not usual, and only a small group earn such a degree. This is not only the case for Belgium. Many countries report problems with low completion rates and are at the moment discussing a number of issues including the improvement of doctoral submission and completion rates, the reduction of drop-out rates among doctoral candidates, and the provision of formal training programmes (Burgess, 1994). This is mainly the case for the humanities but also for some fields of the biomedical sciences.

From 1990-1991 to 1994-1995, the largest group is that of sciences. Depending on the academic year, this group is followed by applied science and medicine. Within the humanities, the largest group is found in language and literature. Students of the sciences, together with applied science, and applied biological science, earn almost 60% of all the doctoral degrees, which stresses the importance of a PhD in these fields of study for research in universities and industry.

The overwhelming achievement of science graduates as far as doctorates is concerned is even more obvious when we compare the proportion of the doctorates with the proportion of FTE assistant position in the sciences: sciences have about 30% of the FTE assistant positions but earn 60% of the doctorates. Moreover, the completion rate of the science students is much higher than that of the humanities: about 46% of the postgraduate science students in the K.U.Leuven (1991-1995) earned a doctorate, while only 23% of the postgraduate humanities students did so (Vandemeulebroecke, 1997).

From 1990-1991 to the present, the proportion of doctoral degrees awarded in science decreased by 10% with respect to the proportion of doctoral degrees awarded in applied science and medicine.

Table 9. Number of doctoral degrees awarded by Flemish universities in the different fields of study

	1990-1991		1991-1992		1992-1993		1993-1994		1994-1995	
Fields of study	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Philosophy and moral science	9	2.12	24	4.91	10	1.82	8	1.34	12	2.05
Theology, religious science, Canon law	7	1.65	15	3.07	6	1.09	14	2.35	19	3.24
Language and literature	36	8.49	17	3.48	58	10.58	23	3.86	22	3.75
History	4	0.94	4	0.82	7	1.28	9	1.51	2	0.34
Archaeology and art	2	0.47	3	0.61	4	0.73	3	0.50	7	1.19
Law, notarial law and criminology	8	1.89	7	1.43	18	3.28	9	1.51	13	2.22
Psychology and educational science	13	3.07	25	5.11	14	2.55	27	4.53	13	2.22
Economic and app. econ. science										
Political and social science	6	1.42	8	1.64	13	2.37	10	1.68	18	3.07
Social health science										
Physical education, Rehabilitation	3	0.71	6	1.23	4	0.73	11	1.85	11	1.88
and physiotherapy	11	2.59	/	/	2	0..36	/	/	2	0.34
Science	4	0.94	4	0.82	4	0.73	6	1.01	4	0.68
Applied science										
Applied biology										
Medicine	192	45.28	177	36.20	203	37.04	218	36.58	190	32.42
Dentistry	35	8.25	71	14.52	81	14.78	97	16.28	86	14.68
Veterinary medicine	31	7.31	49	10.02	44	8.03	46	7.72	49	8.36
Pharmaceutical science	40	9.43	36	7.36	46	8.39	82	13.76	97	16.55
Combined studies	2	0.47	2	0.41	2	0.36	2	0.34	/	/
	/	/	16	3.27	3	0.55	4	0.67	4	0.68
	16	3.77	14	2.86	21	3.83	18	3.02	20	3.41
	5	1.18	11	2.25	8	1.46	9	1.51	17	2.90
Total	424	100.00	489	100.00	548	100.00	596	100.00	586	100.00

Source: VL.I.R. statistics.

Table 10: Number of doctoral degrees awarded by Flemish universities by sex

Academic year	Male	Female
1991-1992	369 (75.46%)	120 (24.54%)
1992-1993	390 (71.17%)	158 (28.83%)
1993-1994	426 (71.47%)	170 (28.53%)
1994-1995	415 (70.82%)	171 (29.18%)

Source: VL.I.R. statistics.

Table 11: Number of doctoral degrees awarded by Flemish universities by nationality

Academic year	Belgians	Foreigners
1991-1992	367 (75.05%)	122 (24.95%)
1992-1993	437 (79.75%)	111 (20.25%)
1993-1994	433 (72.65%)	163 (27.35%)
1994-1995	431 (73.55%)	155 (26.45%)

Source: VL.I.R. statistics.

Although almost as many women as men enter the university, more doctoral degrees are earned by men (Table 10). Nevertheless, the number of female doctors is slightly increasing. Interesting is also the different position of women within the different fields of study. Proportionally, women are more numerous within, for example, the field of language and literature than in the fields of science and applied science. Studies show that women encounter more obstacles in finishing the doctorate than men, for example, because of responsibilities for family life, the relationship with the often male supervisor, the university structure, and low self-esteem (Vandemeulebroecke et al., 1997).

In comparison with the rather small group of foreign undergraduates, the proportion of the foreign students earning a doctorate is rather large (Table 11) but still smaller than the Belgian group. Not all fields of study grant a doctoral degree to foreign students. Most PhD's granted to foreign students are in the fields of science, applied science, applied biological science, and medicine: together they account for 69% of the doctoral degrees granted to foreign students.

Table 12: Number of doctoral degrees as a percentage of the number of degrees awarded at the Flemish universities

Academic year	All degrees	Doctoral degrees	%
1990-1991	7975	424	5.32
1993-1994	7988	596	7.46
1994-1995	8120	586	7.21

Source: Own calculations, based on VL.I.R. statistics.

The number of doctoral degrees as a percentage of the total number of university and postgraduate degrees is about 7%. There are of course important differences between the fields of study. Comparing all degrees and doctor degrees (see Table 7), we note a very high percentage of doctoral degrees in science: 23.81% in 1994-1995. In humanities this percentage is in general less than 7%, e.g. 1.09% in law, notarial law and criminology, 1.37% in applied economics and 4.70% in language and literature. These fields of study have a relatively high number of second-cycle students and a relatively low number of doctoral students.

When we take into account the number of degrees awarded at Flemish two-cycle colleges, the global percentage drops from 7% to 5%. This, however, would be an underestimation of the percentage of doctoral degrees, as only a very small proportion of these students start a doctoral training programme.

Table 13: Age structure of auxiliary academic personnel (AAP) in 1992 and 1996 (Flanders)

Age	1992		1996	
	N	%	N	%
< 24	307	15.90	362	15.91
25-29	1000	51.79	1043	45.92
30-34	378	19.58	445	19.55
>35	246	12.74	426	18.72
Total	1931	100.00	2276	100.00

Source: Bogaert, V. (1996)

One last remark concerning the age structure of the graduate students: Table 13 shows that the average assistant in the Flemish universities is between 25 and 29 years old. Nevertheless, this group has declined from 51.79% to 45.92% over 4 years with respect to the oldest group (+35), which grew from 12.74% to 18.37%.

6.2. The situation in the French-speaking Community

In the French-speaking Community the number of doctoral degrees awarded is rather small (Table 14), but it has increased the last few years: in five years, the number increased by about 23%. Whereas Flanders issued fewer doctoral degrees in 1990-1991 than the French-speaking Community, this changed the next year. The number of doctoral degrees in Flanders increased in the same period by 38%. As in Flanders, the largest group is that of the science students. Together with the students of applied sciences and applied biological sciences, science students earn about 55% to 60% of the degrees in the last five years. The second largest group is that of medicine with 12% of the degrees. Among the humanities students, the students of language and literature form the largest unit.

Table 14: Number of doctoral and 'agrégés de l'enseignement supérieur' degrees awarded in the different fields of studies in the French-speaking Community

	1990-1991		1991-1992		1992-1993		1993-1994		1994-1995	
Field of study	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Theology, religious science, canon law	5	1.10	5	1.13	7	1.59	6	1.27	2	0.36
Language and literature (*1)	58	12.78	52	11.71	41	9.32	39	8.23	49	8.80
Law, notarial law and criminology	6	1.32	8	1.80	13	2.95	4	0.84	8	1.44
Psychology and educational science	34	7.49	18	4.05	29	6.59	23	4.85	18	3.23
Applied economic science	2	0.44	4	0.90	3	0.68	5	1.05	10	1.80
Political and social science, economy										
Physical education, Rehabilitation and	28	6.17	19	4.28	18	4.09	31	6.54	34	6.10
physiotherapy	5	1.10	2	0.45	1	0.23	4	0.84	6	1.08
Science										
Applied science	165	36.34	184	41.44	177	40.23	183	38.61	219	39.32
Applied biology	49	10.79	69	15.54	45	10.23	60	12.66	74	13.29
Medicine and dentistry	40	8.81	29	6.53	29	6.59	50	10.55	42	7.54
Veterinary medicine	55	12.11	43	9.68	66	15.00	56	11.81	69	12.39
Pharmaceutical science	2	0.44	3	0.68	5	1.14	3	0.63	13	2.33
	5	1.10	8	1.80	6	1.36	10	2.11	13	2.33
Total	454	100.00	444	100.00	440	100.00	474	100.00	557	100.00

Source: Cref (1995).

Table 15: Number of doctoral degrees as a percentage of the number of degrees at the French-speaking universities

Academic year	All degrees	Doctoral degrees	%
1990-1991	6,679	454	6.79
1991-1992	6,748	444	6.58
1992-1993	6,698	440	6.57
1993-1994	7,155	474	6.62
1994-1995	7,339	557	7.52

Source: own calculations based on Cref (1995).

The number of doctoral degrees as a percentage of the total number of degrees is about 6.5%. This figure stayed relatively stable over the last five years with a slight increase in 1994-1995. Taking into account the number of graduate degrees from two-cycle colleges, the graduates of which have access to doctoral training programmes, the percentage declines to 4%. This, however, would again be an underestimation of the proportion of doctoral degrees as only a small minority of graduates from second-cycle colleges participate in a doctoral training programme.

As in Flanders, there are important differences between the fields of study. For example, in 1994-1995, the number of doctoral degrees as a percentage of the total number of university and doctoral degrees is 6.13% in language and literature, 1.14% in law, notarial law and criminology, 3.68% in psychology and educational science, 29.2% in science, and 9.26% in applied science.

Table 16. The number of assistant positions at the French-speaking universities according to age and nature of contract (absolute numbers and horizontal percentages) (01/02/1994)

Age	Full-time		Part-time		Total	
	N	%	N	%	N	%
<25	133	75.6	43	24.4	176	100.0
25-29	415	66.2	121	33.8	627	100.0
30-34	216	54.8	178	45.2	394	100.0
>35	82	33.6	162	66.4	244	100.0
Total	846	58.7	595	41.3	1441	100.0

Source: Le Conseil des Recteurs (1995).

Looking at the age structure of the assistants in the French-speaking Community, we note the same conclusions as in the Flemish-speaking Community. Most assistants are between 25 and 29 years old, and 70% of all assistants are between 25 and 34 years old. As the age gets older, the number of assistants

decreases, which is a logical consequence of the nature of the work. Assistant positions are traditionally positions reserved to young people with the ambition of earning a PhD, and such appointments normally do not last longer than six years.

Concerning the nature of the contract (full-time - part-time), a remarkable conclusion is that there are in the youngest categories (up to 35 years) more full-time positions than part-time positions. In the 35-39 category on, the majority of the assistants are part-time.

7. General conclusion

One of the most important developments concerning postgraduate research training at this moment is the shift towards a doctoral training programme. Most, but not all, Dutch-speaking and French-speaking universities have special doctoral training programmes. According to law, the Dutch-speaking universities are supposed to organise a training programme of no less than 1500 and no more than 1800 periods of study or other related activities, but they are free to determine the content of the programme. The legal prescriptions for the French-speaking universities are very vague. They are free to organise the study and work of the doctoral students, but as in Flanders, the universities have special training programmes for their doctoral students. Therefore, the situation in both parts of the country is very similar. This shift from a learning-by-doing model, in which the individual relationship with the supervisor was essential, towards a formal training programme attended by all doctoral students, is a consequence of the international development towards 'graduate schools'. In this respect, Belgium is following other countries like the USA, the UK, France, Australia, Norway, and the Netherlands (Kaiser et al., 1994). However, most universities are still in a transitional period. The first steps have been taken, but the doctoral training still does not have the structure of a 'graduate school'.

Although the number of doctoral degrees is increasing the last years, it is too soon to assess the contribution of the doctoral programmes to the development of the numbers of doctoral degrees awarded. A doctorate in Belgium is still the privilege of a rather small group, which is mainly male in the sciences and applied sciences, for which more resources are available than for humanities scholars, and a doctorate in these fields is valued more on the labour market than a degree in the other fields of study. There are several reasons for this development. Doctoral training was not the main issue of the political debate when the new university decrees were passed, although politicians regularly stressed the importance of scientific research. Consequently, the universities did not receive the financial support needed to organise special programmes. Strict admission conditions and a limited amount of positions keep the number of participants down. Moreover, there is almost no tradition of working for a doctorate,

when the candidate cannot rely on a salary as an assistant or a scholarship provided by one of the scientific funds. Even when the doctoral student has a salary or a grant, the completion of the thesis is retarded by heavy teaching loads and other obligations. Researchers are also disappointed by the lack of opportunities at universities or research centres and by lack of appreciation of a doctorate in Belgian society. All these factors impede the expansion of the number of doctoral degrees, and provide no impetus for the development of the new postgraduate research training.

Finally, the low participation of women is worth mentioning. Only about 25% of all doctoral degrees were awarded to women, whereas 47.4% of the first and second-cycle students in Dutch-speaking universities are female (Hendrickx, 1995b), and 47.19% in the French-speaking universities (Cref, 1995: 4).

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